CLAIMS

What is claimed is:

1. A flying craft comprising:

(a) a substantially rigid suspension structure having a first end and a second end;

(b) a lift unit pivotally coupled to the first end of the suspension structure and including (1) a nacelle and (2) a tailboom pivotally coupled to the nacelle; and

(c) a payload unit coupled to the second end of the suspension structure.

2. The flying craft of claim 1 wherein the nacelle houses a pair of engines.

3. The flying craft of claim 1 further comprising an aerodynamic lift structure of sufficient size to provide a majority of upward force from the lift unit during horizontal flight.

4. The flying craft of claim 3 wherein the aerodynamic lift structure includes a pair of pivotally coupled wing panels, wherein each panel is capable of selectably assuming either orientation of (a) being substantially parallel to the tailboom, and (b) extending substantially orthogonal from the tailboom.

5. The flying craft of claim 1 wherein the lift unit further includes a tailboom actuator coupled to pivot the tailboom with respect to the nacelle.

6. The flying craft of claim 1 wherein the lift unit further includes a rotor mounted on a hub at one end of the nacelle.

7. The flying craft of claim 6 wherein the lift unit further includes a tailboom actuator coupled to pivot the tailboom with respect to the nacelle.

8. The flying craft of claim 6 wherein the rotor consists substantially of two sets of rotor blades, the sets being independently rotatable about the hub.

9. The flying craft of claim 8 wherein the rotor has a radius that is slightly less than the distance between the first and second ends of the suspension structure.

10. The flying craft of claim 8 further comprising latchable pivot couplings between each of the blades and the hub, whereby the blades are selectably capable of orienting parallel to the tailboom for compact stowage of the craft.

11. The flying craft of claim 10 wherein the rotor has a radius of about 40 feet and the tailboom has a length of about 40 feet, whereby the blades are selectably capable of orienting parallel to the tailboom for compact stowage of the craft on a standard naval weapons elevator.

12. The flying craft of claim 6 wherein the tailboom includes a horizontal stabilizer and an elevator.

13. The flying craft of claim 12 wherein the tailboom further includes a vertical stabilizer and a rudder.

14. The flying craft of claim 6 further comprising a fastener connected to one of the tailboom and payload unit and latchably coupling the tailboom to the payload unit,

wherein the tailboom, when latched to the payload unit, is fixed in an orientation substantially parallel to the suspension structure.

15. The flying craft of claim 14 wherein, when the tailboom is latched to the payload unit and resting on a surface, the lift unit is partially supported by the tailboom.

16. The flying craft of claim 6 wherein the lift unit is:

(a) freely rotatable, within at least a predetermined angular range, about a rotational axis orthogonal to an axis passing through the first and second ends of the suspension structure; and

(b) substantially restricted in movement relative to the first end of the suspension structure in a direction parallel to the rotational axis.

17. The flying craft of claim 6 wherein the payload unit lacks structure to support its own weight in flight and has at least a significant part of its weight suspended from the lift unit.

18. The flying craft of claim 17 wherein the payload unit includes a vertical stabilizer and a rudder.

19. The flying craft of claim 17 wherein the payload unit includes shipping container supports spaced about 20 feet apart from each other and about 10 feet from the second end of the suspension structure.

20. The flying craft of claim 6 further comprising an aerodynamic lift structure of sufficient size to provide a majority of upward force from the lift unit during horizontal flight and

including a pair of pivotally coupled wing panels, wherein each panel is capable of selectably assuming either orientation of (a) being substantially parallel to the tailboom, and (b) extending substantially orthogonal from the tailboom.

21. The flying craft of claim 20 wherein:

(a) the rotor consists substantially of two sets of rotor blades, the sets being independently rotatable about the hub;

(b) the rotor has a radius that is slightly less than the distance between the first and second ends of the suspension structure; and

(c) the lift unit further includes a tailboom actuator coupled to pivot the tailboom with respect to the hub.

22. A method comprising:

(a) providing a lift unit including a propulsion subsystem and a tailboom;

(b) providing a payload unit pivotally coupled to the lift unit such that the tailboom and payload unit are free to independently pivot with respect to each other about a first axis;

(c) operating the lift unit in a first mode wherein its propulsion subsystem provides an aerial motive force predominantly countering gravity;

(d) during at least a portion of the first mode, latching the tailboom to the payload unit in a substantially vertical orientation;

(e) transitioning the lift unit to a second mode wherein its propulsion subsystem provides an aerial motive force predominantly parallel to the ground; and

(f) during at least a portion of the second mode, releasing the tailboom from the payload unit, thereby allowing it to pivot independently of the payload unit.

23. The method of claim 22 wherein providing the lift unit comprises providing a rotor as the propulsion subsystem.

24. The method of claim 23 wherein:

(a) providing the lift unit comprises providing a pair of blade sets as the rotor; and

(b) operating the lift unit comprises rotating the blades of one set in an opposite direction to blades of the other set.

25. The method of claim 23 further comprising, before operating the lift unit in the first mode, resting the lift unit on a support surface alongside the payload unit.

26. The method of claim 25 wherein:

(a) the lift unit is pivotally coupled to the payload unit through a rigid suspension structure; and

(b) the method further comprises, at the beginning of the first mode, moving the lift unit away from the support surface and about the payload unit in an arc until it begins to suspend the payload unit.

27. The method of claim 26 further comprising:

(a) providing a pair of wing panels pivotally coupled to the tailboom; and

(b) before moving the lift unit, unfolding the wing panels from (1) a stowed position substantially parallel to the tailboom to (2) a deployed position extending substantially orthogonal from the tailboom.

28. The method of claim 23 wherein suspending the payload further comprises constraining the payload from pivotal movement about all axes orthogonal to a first axis.

29. The method of claim 23 further comprising, before operating the lift unit, resting the payload unit on a surface with the tailboom latched thereto, wherein the lift unit is at least partially supported by the tailboom.

30. The method of claim 23 wherein releasing the tailboom includes permitting rotation of the tailboom, within an angular range, about a rotational axis orthogonal to an axis passing between the lift unit and the payload unit.

31. The method of claim 30 further comprising, after releasing the tailboom, pivotally driving the tailboom with respect to the lift unit.

32. The method of claim 30 further comprising, after releasing the tailboom, controlling pitch of the tailboom with a horizontal stabilizer and an elevator.

33. The method of claim 30 further comprising, after releasing the tailboom, controlling yaw of the tailboom with a vertical stabilizer and a rudder.

34. The method of claim 23 wherein providing the lift unit further comprises providing a pair of wing panels pivotally coupled to the tailboom, the method further comprising:

(a) while the tailboom is latched to the payload unit, having the wing panels oriented substantially parallel to the tailboom; and

(b) while the the tailboom is released from the payload unit, having the wing panels extending substantially orthogonal from the tailboom.

35. The method of claim 23 further comprising:

(a) permitting the lift unit to freely rotate, within at least a predetermined angular range, about a rotational axis orthogonal to an axis passing through the first and second ends of the suspension structure; and

(b) substantially constraining the lift unit from movement relative to the first end of the suspension structure in a direction parallel to the rotational axis.

36. A system for transporting a payload, comprising:

(a) a lift unit including a rotor and a tailboom;

(b) a payload unit pivotally coupled to the lift unit such that the tailboom and payload unit are free to independently pivot with respect to each other about a first axis;

(c) means for operating the rotor of the lift unit to provide an aerial motive force;

(d) means for orienting the lift unit to develop the aerial motive force in a desired direction; and

(e) means for selectably (1) latching the tailboom to the payload unit in a substantially vertical orientation and (2) releasing the tailboom from the payload unit, thereby allowing it to pivot independently of the payload unit.

37. The system of claim 36 further comprising means for:

(a) permitting the lift unit to freely rotate, within at least a predetermined angular range, about a rotational axis orthogonal to an axis passing through the first and second ends of the suspension structure; and

(f) substantially constraining the lift unit from movement relative to the first end of the suspension structure in a direction parallel to the rotational axis.